Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method of removing one or more particle(s) adhered to a surface of a substrate, comprising:

selecting laser energy transfer parameters and a composition, thickness, and geometry of an energy transfer medium based on a predetermined removal threshold determined for a composition of the one or more particle(s) to be removed and a composition of the substrate, wherein the selected laser energy transfer parameter comprise at least laser beam shape and/or size, and irradiation geometry;

arranging an energy transfer medium having said composition, thickness, and geometry under and around the one or more particle(s) to be removed; and

irradiating at least said energy transfer medium with laser energy having said selected laser energy transfer parameters, wherein said laser energy transfer parameters and said composition, thickness, and geometry of said energy transfer medium are selected to control energy deposition into at least said energy transfer medium based on the predetermined removal threshold designed to effect removal of the one or more particle(s) from the surface while minimizing damage to the substrate, wherein the predetermined removal threshold is greater

than forces adhering the one or more particle(s) to the surface and less than a damage threshold of the substrate.

2. (Previously Presented) The method according to claim 1, wherein arranging an energy transfer medium under and around the one or more particle(s) to be removed comprises adsorbing an energy transfer medium under and around the one or more particle(s) to be removed.

3. (Previously Presented) The method according to claim 1, wherein the laser energy transfer parameters comprise the wavelength of the laser energy, the density of the laser energy, the length and shape of the laser pulse, the pulse repetition rate of the laser energy, and the laser beam size and/or shape, and the irradiation geometry of the particle(s)/substrate/energy transfer medium.

4. (Withdrawn) The method according to claim 1, wherein selecting the laser energy transfer parameters comprises selecting the wavelength of the laser energy.

5. (Withdrawn) The method according to claim 1, wherein selecting the laser energy transfer parameters comprises selecting the density of the laser energy.

6. (Previously Presented) The method according to claim 1, wherein the step of selecting the laser energy transfer parameters comprises selecting the length and shape of the laser pulse.

7. (Withdrawn) The method according to claim 1, wherein selecting the laser energy transfer parameters comprises selecting the pulse repetition rate of the laser energy.

8. (Previously Presented) The method according to claim 1, wherein selecting the laser energy transfer parameters comprises selecting the laser beam size and/or shape.

9. (Previously Presented) The method according to claim 1, wherein selecting the laser energy transfer parameters and the composition, thickness, and geometry of the energy transfer medium comprises selecting the irradiation geometry of the particle(s)/substrate/energy transfer medium.

10. (Previously Presented) The method according to claim 1, wherein irradiating at least the energy transfer medium comprises irradiating the particle(s)/substrate/energy transfer medium combination.

11. (Original) The method according to claim 1, further comprising selecting ambient conditions based on a composition of the one or more particle(s) to be removed and a composition of the substrate.

12. (Withdrawn) The method according to claim 4, wherein the wavelength of the laser is selected such that the laser energy diffracts around at least some of the one or more particles(s) to be removed.

13. (Withdrawn) The method according to claim 4, wherein the wavelength of the laser is selected such that it is substantially the same size as the one or more particle(s) to be removed.

14. (Original) The method according to claim 1, wherein the composition of the energy transfer medium is selected such that it will couple efficiently with the laser energy of the laser.

15. (Previously Presented) The method according to claim 1, wherein selecting the laser energy transfer parameters comprises selecting at least one of the wavelength of the laser pulse, the density of the laser energy, the length and shape of the laser pulse, the pulse repetition

rate of the laser energy, the laser beam size and/or shape, the irradiation geometry, and/or the ambient conditions.

16. (Canceled).

17. (Previously Presented) The method according to claim 15, wherein the laser wavelength of the laser energy, the density of the laser energy, the length and shape of the laser pulse, the pulse repetition rate of the laser energy, the laser beam size and/or shape, the irradiation geometry, the ambient conditions, and/or the composition, thickness, and geometry of the energy transfer medium are selected based on application and environment.

18. (Original) The method according to claim 1, wherein the laser energy is sufficient to be absorbed by the energy transfer medium, either directly or by conduction from the substrate.

19. (Withdrawn) The method according to claim 4, wherein the wavelength of the laser energy is targeted to the one or more particle(s), the substrate and/or the energy transfer medium.

20. (Original) The method according to claim 6, wherein the pulse length of the laser energy is sufficiently short in order to achieve a desired temperature distribution of the energy transfer medium.

21. (Withdrawn) The method according to claim 5, wherein the laser energy density is sufficient to be absorbed by the one or more particle(s), the substrate, or the energy transfer medium.

22. (Original) The method according to claim 8, wherein the laser beam size and/or shape is selected to clean as large a surface area as possible.

23. (Previously Presented) The method according to claim 1, wherein the composition, thickness, and geometry of the energy transfer medium are selected so that the energy transfer medium is a predetermined uniform thickness layer, adsorbed under and around the one or more particle(s) to be removed, or a combination thereof.

24. (Previously Presented) The method according to claim 23, wherein the composition, thickness, and geometry of the energy transfer medium are selected so that the energy transfer medium is a predetermined uniform thickness layer.

25. (Previously Presented) The method according to claim 23, wherein the composition, thickness and geometry of the energy transfer medium are selected so that the energy transfer medium is adsorbed under and around the one or more particle(s) to be removed.

26. (Original) The method according to claim 1, wherein the energy transfer medium comprises a condensable material that is strongly absorbing at the selected wavelength.

27. (Previously Presented) The method according to claim 1, wherein the energy transfer medium comprises an azeotrope.

28. (Previously Presented) The method according to claim 1, wherein the energy transfer material is deposited by separately controlled multiple dosers.

29. (Previously Presented) The method according to claim 1, wherein the energy transfer medium is deposited by a constant composition non-azeotropic single doser.

30. (Previously Presented) The method according to claim 1, wherein irradiating at least the energy transfer medium with laser energy comprises irradiating a surface of the substrate opposite to the surface containing the energy transfer medium.

31. (Original) The method according to claim 1, wherein the substrate comprises a non-absorbing material, and the energy transfer medium comprises an absorbing mixture.

32. (Original) The method according to claim 31, wherein the substrate comprises at least one of SiO_2 and a CaF_2 substrate, and the energy transfer medium comprises an azeotrope of benzyl alcohol and water.

33. (Currently Amended) A method of removing one or more particle(s) adhered to a surface of a substrate, comprising:

adsorbing an energy transfer medium under and around the one or more particle(s) to be removed, wherein a composition, thickness, and geometry of the energy transfer medium are selected based on a predetermined removal threshold determined for a composition of the one or more particle(s) to be removed and a composition of the substrate;

irradiating the one or more particle(s), the substrate, the energy transfer medium, or a combination thereof with laser energy; and

selecting the laser beam size and shape and/or shape, the irradiation geometry, and one or more of the laser wavelength of the laser energy, the length and shape of the laser pulse, the density of the laser energy, the pulse repetition rate of the laser energy, ~~the laser beam size and/or shape, the irradiation geometry,~~ and the ambient conditions, ~~and~~ as well as a composition, thickness, and geometry of the energy transfer medium based on the

predetermined removal threshold designed to precisely control energy deposition into at least the energy transfer medium; and

absorbing sufficient laser energy in at least the energy transfer medium to dislodge the one or more particle(s) from the surface while minimizing damage to the substrate, wherein the predetermined removal threshold is greater than forces adhering the one or more particle(s) to the surface and less than a damage threshold of the substrate.

34. (Previously Presented) The method according to claim 33, wherein the one or more of the laser wavelength of the laser energy, the length and shape of the laser pulse, the density of the laser energy, the pulse repetition rate of the laser energy, the laser beam size and/or shape, the irradiation geometry, and the ambient conditions and the composition, thickness, and geometry of the energy transfer medium are selected based on application and environment to precisely control an energy deposition into at least the energy transfer medium.

35. (Currently Amended) A method of removing one or more particle(s) from a surface of a sample, comprising:

selecting an optical radiation source having an optical energy distribution;

determining a tailored composition with a tailored thickness and geometry to serve as an energy transfer medium for said optical radiation source having said optical energy

distribution based on a predetermined removal threshold for a composition of the one or more particle(s) and a composition of the sample; ~~and~~

determining a tailored optical pulse of said optical radiation source in view of said composition, thickness, and geometry of the energy transfer medium, a surface of a sample, a sample and/or one or more particle(s) to be removed from a sample based on the predetermined removal threshold, such that when said energy transfer medium is arranged on the surface of the sample having the one or more particle(s) and is subsequently irradiated by said optical radiation source, sufficient energy is transferred from the tailored optical pulse to said one or more particle(s) via the energy transfer medium to dislodge said one or more particle(s) from the surface while minimizing damage to the sample, wherein the predetermined removal threshold is greater than forces adhering the one or more particle(s) to the surface and less than a damage threshold of the sample; and

obtaining the tailored optical pulse by adjusting optical pulse parameters comprising at least optical beam shape and/or size, and irradiation geometry.

36. (Currently Amended) A method of removing one or more particle(s) from a surface of a sample, comprising:

determining an optical energy distribution of an optical radiation source based on the optical characteristics of a surface of a sample, a sample and/or one or more particle(s) to be removed from the sample;

tailoring a composition, thickness, and geometry of an energy transfer medium in view of optical properties of said sample and said optical energy distribution based on a predetermined removal threshold for a composition of the one or more particle(s) and a composition of the sample;

determining a tailored pulse in view of said composition, thickness, and geometry of said energy transfer medium, said optical energy distribution, the surface, the sample and/or the one or more particle(s) to be removed from the sample based on the predetermined removal threshold;

applying said energy transfer medium to the surface of the sample; ~~and~~

obtaining the tailored pulse by adjusting pulse parameters comprising at least optical beam shape and/or size, and irradiation geometry; and

irradiating at least the energy transfer medium with the tailored pulse thereby dislodging the one or more particle(s) from the surface while minimizing damage to the sample, wherein the predetermined removal threshold is greater than forces adhering the one or more particle(s) to the surface and less than a damage threshold of the sample, and wherein the optical radiation pulse is tailored by adjusting optical radiation pulse parameters comprising at least optical beam shape and/or size, and irradiation geometry.

37. (Currently Amended) A method of removing one or more particle(s) from a surface of a sample, comprising:

arranging an energy transfer medium having a predetermined composition, thickness, and geometry on a surface of a sample wherein the composition, thickness, and geometry of the energy transfer medium are based on a predetermined removal threshold for a composition of the one or more particle(s) and a composition of the sample;

irradiating said energy transfer medium with an optical radiation pulse tailored to said one or more particle(s), said sample, and said energy transfer medium based on the predetermined removal threshold such that energy from said tailored optical radiation pulse is absorbed largely by said energy transfer medium but not significantly by the sample causing the one or more particle(s) to be removed from the surface while minimizing damage to the sample, wherein the predetermined removal threshold is greater than forces adhering the one or more particle(s) to the surface and less than a damage threshold of the sample, and wherein the optical radiation pulse is tailored by adjusting optical radiation pulse parameters comprising at least optical beam shape and/or size, and irradiation geometry.

38-65. (Canceled).

66. (Currently Amended) A method of effecting controlled energy deposition into an energy transfer medium to remove one or more particles(s) adhered to a surface of a substrate, said one or more particles(s) and said substrate together yielding a particle(s)/substrate combination, comprising:

selecting laser energy transfer parameters and a composition, thickness, and geometry of the energy transfer medium based on a predetermined removal threshold determined for the particle(s)/substrate combination, wherein the selected laser energy transfer parameters comprise at least laser beam shape and/or size, and irradiation geometry;

arranging the energy transfer medium having said composition, thickness, and geometry under and around the one or more particle(s) to be removed to yield a particle(s)/substrate/energy transfer medium combination;

determining laser energy transfer parameters based on the predetermined removal threshold yield controlled energy deposition into at least said energy transfer medium; and

irradiating at least said energy transfer medium with said laser energy having said selected laser energy transfer parameters to effect controlled energy deposition into at least said energy transfer medium, wherein said controlled energy deposition removes the one or more particle(s) from the surface while minimizing damage to the substrate, wherein the predetermined removal threshold is greater than forces adhering the one or more particle(s) to the surface and less than a damage threshold of the substrate.